DEFENSE WEEK CONFERENCE ON EVMS

Keynote Remarks
by
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INTRODUCTION

It's a pleasure to be here with you, participating in this conference on "Earned Value Management Systems (EVMS): The 'New' Decision-Making Tool for Project Managers." Coming from a program management background, I remember well the "old" mandated tool … what we knew as Cost/Schedule Control Systems Criteria, or C/SCSC. Unfortunately, like most program managers, I viewed the old tool as a reporting process element rather than a management enabling device.

There is a reason why I'm pleased to be with you this morning, and it's not because it got me out of the Pentagon for a little while. It's because I can stand before you and declare that in adopting EVMS we have not simply renamed an old tool. EVMS in its broadest sense is a fundamentally new way of doing business, consistent with acquisition reform, and essential to improved planning and execution of our most complex programs.

I am also happy that Defense Week sponsored this conference now, coincident with the new management guidelines issued by the Office of Management and Budget. This event provides a unique opportunity for our colleagues in the civilian agencies to obtain the benefit of our experience in the Department of Defense, as they act to respond to the OMB guidance … guidance which stresses the importance of risk management and the application of performance based management systems in the planning, budgeting, procurement and use of capital assets.

In the Defense acquisition business, we have used earned value techniques for three decades … but not always as effectively as we would like. You will hear more about that later this morning. Today and tomorrow, you will have a chance to learn from some excellent government and industry managers who are using earned value effectively in their integrated product teams. You will also hear from industry leaders who are using earned value on all their product lines, not just government products. I would like to thank them, and all the other speakers who volunteered their time to contribute to the agenda.

This conference boasts a singular event … the first public briefing of the General Accounting Office report on EVMS. The report is important because it's a

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thorough and timely assessment of the tool OMB has built into Circular A-11 Part 3 and the Capital Programming Guide. This level of visibility by the investigative arm of the Congress and the Executive Office of the President confirms the importance of EVMS as a management tool which will serve American taxpayers well for years to come.

THE DEFENSE MANAGEMENT ENVIRONMENT

Today, from a defense strategy standpoint, our management challenges, especially the task of managing risk, have become perhaps more complicated than ever before. While the threat of global war with a peer competitor has essentially disappeared, at least in the near term, the world remains a tumultuous and, in many ways, a more unpredictable place. Instability in Southwest and Northeast Asia, and nationalism and ethnic tensions in Europe, pose risks that are difficult to know, much less manage. The proliferation of weapons of mass destruction threatens our interests, our forces, and even our homeland. And threats from terrorism, international organized crime, and drug trafficking still plague us.

Politically, economically, and technologically, the world is changing at an unprecedented and sometimes unsettling rate. Our destiny is being bound ever more closely to foreign interests by the technological "shrinking" of time and distance. While this may work to our advantage as we seek to promote free markets and the principles of democracy, it increases the degree to which we are affected by external developments and risks. We do not have the choice of insulating ourselves from the forces sweeping the globe. We have to be able to effectively manage the associated risks.

So in a sense, our challenges on a macro level of world affairs and national defense are not too fundamentally different from the challenges we face on a micro level of program management … and I believe the challenges we face in Defense program management are not fundamentally different from the challenges faced by the civilian agencies. Certainly we all face the familiar problem of complex systems integration, whether our final product is a new fingerprint identification system, an earth resources observation satellite, or a weapon system. Whatever the differences among our capital assets, there should be no differences in the principles applied to acquisition of those assets.

KEYNOTE THEME

I would like to share with you today some thoughts on change and risk management, especially as they relate to defense acquisition policies and reform initiatives associated with the "EVMS" conference theme.

CHANGE, RISK AND OPPORTUNITY

The inevitability and the pace of change may sound like tired cliches, but they are real. Change presents us with confusing and unfamiliar situations in which we have to make choices. That sage philosopher Woody Allen once said, "More than anytime in history, mankind faces a crossroads. One path leads to despair and utter hopelessness, the other to total extinction. Let us pray that we have the wisdom to choose correctly."

It may seem that change does limit choice. But the fact is that the paths are usually unlimited, and it just takes an ability to sort through the confusion to find an acceptable course. Good risk management techniques can help.

The really good news is that change, in itself, is not bad. As rational adults, by now you should have accepted the fact that there will be more change than stability in the future. It's not the change, but the uncertainty that accompanies change, that can drive us up a wall!

Managing the uncertainty, not the change, should be the focus of our energy. Why? Because change always brings two strange bedfellows along with it … risk and OPPORTUNITY. We don't ever want to suppress the opportunity that is always a by-product of change. That is why risk management is such an important element of our day-to-day performance, and why it is so critical to any reform effort. Our focus must be to manage the risks so we can seize the opportunities.

Some would argue that risk must be completely avoided. Others believe that risk cannot be avoided, so we should accept it as a part of the price of any complex program and solve the problems as they come up. I suggest the answer lies between these extremes. The best use of scarce resources in any program requires that we identify risks, determine an acceptable level for each, and establish those levels as the objectives for managing the risks.

DEFENSE ACQUISITION POLICY

Our current defense acquisition policy guidance emphasizes risk management and requires four key elements:

1. The first of these is CONTINUOUS ASSESSMENT. It is no longer sufficient to perform a "check-the-box" risk assessment early in the program, make a few risks visible for an acquisition review, and then put the document on the shelf. We are looking for a well-executed set of processes for risk identification, analysis, mitigation, planning and closure … applied continuously over the span of the program.
2. The second element is DEVELOPMENT OF RISK MANAGEMENT APPROACHES PRIOR TO A DECISION TO PROCEED TO THE NEXT PHASE. It is especially important to identify and evaluate program uncertainties before proceeding to make new contractual commitments. Not only do the exit

criteria from the current phase need to be achieved, but the risks and strategies for the next phase have to be identified and planned, with new exit criteria defined.

3. A critical third element is the INCLUSION OF IDENTIFICATION, MITIGATION, TRACKING AND CONTROL MECHANISMS. A successful and complete risk management process must go beyond risk identification … that's what the old "Red Team" approach did … failing to define what to do with the information once known. Mitigation plans must be developed, tracked and adjusted with time.
4. Finally, there must be an EQUITABLE AND SENSIBLE ALLOCATION OF RISK BETWEEN GOVERNMENT AND INDUSTRY. Proper contractual terms and conditions are essential to equitably share the risks—and to incentivize their mitigation—between customer and supplier. We know that if a contract isn't sensible to both parties, undesired outcomes usually follow.

COST AS AN INDEPENDENT VARIABLE

The Application of risk management processes is particularly crucial during the early phases of any program, when alternatives are evaluated, objectives are established, and the acquisition strategy is developed. Use of "Cost As an Independent Variable" principles provides for flexible choices in managing risks. These principles recognize that needed government capabilities are, in most cases, best expressed as end results, which actually are the aggregate combination of numerous, more detailed parameters. With rare exception, there are multiple sets of detailed specifications that can be combined to attain the desired end result, so that any one item can be varied significantly so long as compensating adjustments are made elsewhere in the system.

By setting aggressive but realistic cost objectives concurrent with defining operational requirements … and then managing achievement of the objectives through, among other things, cost-performance tradeoffs … cost becomes more of a constraint, and less of a variable. The best way to facilitate achievement of aggressive but realistic cost objectives is to understand the risks and identify, analyze and define mitigation strategies early … so that we can know the unexpected, acceptable levels of risk, and estimate the costs of mitigation. Understanding the risk is essential to setting realistic cost objectives.

OTHER REFORM INITIATIVES

We have substantially improved defense acquisition in the past four years through the application of various reform initiatives. These can generally be described as adopting and using best buying practices and business processes. Among other things, we have established integrated product teams and integrated

product and process development (IPPD), and encouraged contractors to adopt single processes for government and commercial work.

Integrated Product Teams & Integrated Product and Process Development

If you were to ask me what the single most valuable acquisition reform initiative has been to date, I would unhesitatingly answer … the introduction of integrated product teams, and the integrated product and process development concept. Both are now in wide-use throughout our defense programs. They have been readily embraced because they produce instant benefits through the power of teamwork and delegation of authority.

The IPPD concept integrates all acquisition activities starting with requirements definition and continuing through production, deployment and operational support in order to optimize the design, manufacturing, business, and support processes. At the core of IPPD implementation are integrated product teams, which bring together representatives from various disciplines at the very start of the project.

This helps us manage risk by allowing for early and continuous insight by all the stakeholders. It also encourages team members to work together in an atmosphere of trust and cooperation, and allows informed decision making to take place at appropriate levels. The improved communication between customer and supplier, and the many functional disciplines represented in a program, enhances risk management as a natural outcome of eliminating barriers to knowledge. By having knowledgeable people work toward a common objective as a team, we enhance our ability to fully integrate risk identification, analysis and mitigation measures in all areas.

Single Process Initiative

The Single Process Initiative is a means to eliminate costly, multiple processes within individual contractor facilities. The goal is to consolidate or eliminate multiple management and manufacturing processes and rely on world class commercial processes as much as possible … thus achieving cost reduction, better products, and fostering a more competitive industry. This allows contractors to use the same processes to make commercial and defense products, and in turn, gives them the flexibility to allow their suppliers to consolidate their processes. More than 140 contractors have proposed about 700 process changes, of which 290 have been approved to date.

PROGRAM INSTABILITY

Although we have made remarkable progress in reforming much of the acquisition process, the problem of program funding instability remains a work in

progress. We have now embraced this as our most important acquisition reform issue to be addressed in the near future.

Virtually every major study of the defense acquisition process in the last twenty years has cited instability as a major contributor to cost growth of defense systems. In fact, detailed studies by RAND have shown that major acquisition programs experience an average of 20% cost growth from the estimates at the point of entry into engineering & manufacturing development. Approximately half of that growth is attributable to funding instability. The increases result from a variety of factors and competing priorities including unplanned contingency operations (for example, peacekeeping in Bosnia), underestimated operating and support requirements, changing priorities for systems in response to changes in the anticipated threat, and technical difficulties.

Our emphasis on readiness and personnel quality of life initiatives, coupled with the dramatic decline in the defense top line budget, has left little latitude in reacting to unplanned expenditures without decrementing the investment accounts. As a result, large numbers of programs have been forced to serve as bill-payers, leading to reduced production rates and schedule stretches. Program delays not only increase program costs, they also tie up resources that were planned to be used for other projects in later years. We are investigating a range of approaches to address the issue. Three mechanisms seem to be emerging as key components of a solution:

1. ***Fiscal Guidance Constraint***

The first is associated with constraining our fiscal guidance from which investment programs are planned and programmed. Current practice is to allocate 100% of anticipated resources to anticipated requirements. This assumes we can predict our requirements and budgets with certainty as much as six years into the future. As a result, not only do we not plan to operate with a reserve, we actually plan to operate with a "negative" reserve!

Not surprisingly, we have documented a consistent pattern of resource shift, from long-term investment programming to near-term operation and support. We are considering a mechanism that is intended to restrain expectations in out-year programming for investment and create a prudent reserve to permit more flexibility in addressing emergent requirements.

2. ***Contingency Funding***

The second mechanism deals with fact-of-life contingency operations. Over the five years from 1992 through 1996, an average of $2.5 billion per year was required to support contingency operations such as Haiti, Somalia, and Bosnia. Because these operations were unplanned, no resources had been specifically

programmed or budgeted for them. Generally speaking, we have had to pay the bulk of these bills from investment accounts.

We have recently begun budgeting for the continuation of these known operations, but to the extent that unpredictable contingencies are inevitable, we have no viable mechanism to deal with their destabilizing effects on investment programs. Even in the face of empirical evidence defining the size of this annual known-unknown, legislators are loathe to allow this kind of reprogramming activity to occur. For now, we can only mitigate about half of this destabilizing effect each year.

3. ***Budgeting for Technical Risk***

The third mechanism addresses inherent technical risk in individual programs. The first step in managing program risk is to accept the fact that uncertainties and risks are associated with any major development effort. With that in mind, it is good business practice to plan and provide sufficient reserves to accommodate these factors if the need arises.

We intend to move to a policy of building budgets for programs that incorporate reasonable and prudent reserves, determined by effective risk management techniques. Key to viable implementation of such a reserve mechanism is the need to closely couple appropriate contractual incentives which ensure a more profitable outcome for contractors if the reserve is not used. At the same time, however, the reserve is necessary to encourage the government-contractor team to establish "stretch goals" for program performance.

To repeat a point I made earlier, "The best use of scarce resources in a program requires identification of risks, determination of an acceptable level for each, and establishment of those levels as the objectives for managing the risks." To the extent we do not provide reserves in programs at the appropriate level and the risk manifests itself, we contribute to the instability of other investment programs of lesser priority because they become the bill-payers.

THE ROLE OF SYSTEMS ENGINEERING

Each of the acquisition reform initiatives I have mentioned can be an enabler for effective risk management … and earned value is related to each. I will get to earned value in just a moment, but first let me caution that even in their most optimistic application, these initiatives will not eliminate risk or negate the need to manage risk at an acceptable level. We need to return to the basics of systems engineering and we need to recognize that risk management is fundamentally a program management activity.

I think we also need to consider the idea that good program management principles can be universal in their application. We sometimes hear that defense and civilian agency programs are too different to manage using the same techniques. Within DoD, we hear things like, “ships are different,” “you can’t manage satellites like you manage airplanes,” or “my program is too unique” to be managed like a “typical” program. It’s simply hard to accept the idea that their isn’t a set of sound ideas and practices that are applicable to managing any conceivable program.

Another argument often made is that “software can’t be managed like hardware”, or “weapon system software can’t be managed like business system software’. We manage it all in DoD, and I expect in the software area we share much common ground with our counterparts in other government agencies.

While the legacy of defense procurement includes plenty of examples of projects over budget, over schedule, and under performance, software has proved a particularly difficult challenge. In the past, we selected the best suppliers we could find … and hoped they would perform. We imposed layers of prescriptive requirements on top of industry practices, and used the requirements to develop, test and support embedded computers and software, tailored to ship classes, aircraft models, or warfare areas. The resulting products were, and are, costly to support, update and maintain. Acquisition reform has ameliorated some of the contributors to this unenviable legacy, but we must also apply the discipline of good systems engineering to confront the problem fully … and this includes risk management.

Our chronic underestimation of costs and schedules for software development, coupled with misbegotten attempts to use software to remedy other system shortfalls late in the system development process, leads me to question whether we understand the relationship of software and systems engineering. Today’s systems are highly integrated, making it increasingly difficult to draw an imaginary line between hardware and software. Increasing demands are being placed on the human-machine interface. More and more system processes are automated. The systems must be managed in their totality, and that includes managing risks. It bears repeating: The principles of management are largely the same whether you are talking about hardware or software, and risk management should be a discipline applied to the total system.

EARNED VALUE AS A MANAGEMENT TOOL

Finally, we come to the heart of the matter: Just what does earned value have to do with all this?

Earned value is the only technique proven to effectively integrate cost, schedule and technical performance management. I won’t ask you to accept that on

faith. Two people you may have heard of … Gary Christle, my Deputy for Performance Management, and Wayne Abba, our senior program analyst for performance management … have searched many years for the best approaches to facilitate management of public resources contained in the defense acquisition budget. They were helped in their quest by reformers and reviewers of every stripe, including the DoD Inspector General, GAO, and OMB. Not only have we not found a better way, but other governments and industry increasingly are adopting earned value based on the principles embodied in the DoD requirements.

If you came here today thinking you could hire a contractor to do "earned value reporting" for you and thereby satisfy the OMB requirements, I have bad news for you. That was how earned value often was viewed by program managers in the past … a legacy of its identification with financial management and reporting. We moved to rectify that in 1989 by reassigning responsibility for earned value management from the office of the Comptroller to the office of the Under Secretary for Acquisition and Technology.

But cultural change does not happen quickly. Following a thorough review of earned value requirements by his Deputy Under Secretary for Acquisition Reform, the Under Secretary in 1995 had this to say about earned value:

> The term "earned value management process" means to me … that whenever the Department puts public funds at risk … a process exists to <u>manage</u> those resources wisely. Let me repeat … I expect public funds to be managed wisely. The key word is "managed." Not "accounted for," "monitored," or "reported," but <u>managed</u>.

By reaffirming earned value management as the "tool of choice" for complex programs, Paul Kaminski reminded us that acquisition reform does not mean throwing out the baby with the bath water. While we may still have work to do to reinvent the process and get it right, we believe that a thirty-year old idea, properly implemented, can help define world-class program management.

Earned value must be an integral part of program planning, and therefore of the risk management approach. The link between program cost, schedule and technical performance objectives must be established at an appropriate level of detail well in advance of contract award. At one time, we often left such planning to the cost estimating community. Today, we are working to return program definition … represented by the work breakdown structure … to systems engineering through an integrated product team approach.

While government program managers must understand how earned value will contribute to the planning and execution of their programs, contractors are the real owners of the earned value management process. The biggest factor in our success in redefining earned value has been to return it to its rightful owners. Of course, that means industry must accept responsibility for its own management

systems, and that is happening. In fact, industry has drafted an EVMS standard that may be published later this year. You'll hear about that this afternoon.

The industry EVMS initiative is a natural fit with the DoD Single Process Initiative. We have found that one earned value management system can meet the needs of all customers. For example, about five years ago Boeing introduced a single management process called Integrated Management System IV. It has since been implemented throughout the Defense & Space Group because it meets DoD customer needs as well as Boeing management needs for in-house and other work. In February of this year, it was also recognized by NASA. Other industry leaders who have decided to use earned value enterprise-wide include Lockheed Martin Missiles & Space, Motorola, and McDonnell Douglas.

Contractor and government program managers rely on teamwork to execute their contracts successfully. Earned value is one of the team's most important tools, but not as we implemented it under C/SCSC. Let me explain what I mean.

If you give a program manager a tool that is identified with cost accounting, its use will be assigned to an accountant. If you give a program manager a tool that's identified with cost reporting, its use will be assigned to a cost analyst. We used both of those approaches under C/SCSC. Neither fostered teamwork or effective management. With EVMS we have given program managers a tool and illustrated its value as a management device.

An essential part of EVMS application is the Integrated Baseline Review. Working together soon after contract award (even earlier in a noncompetitive situation), the government and contractor team discuss plans to execute the contract in terms of scope, schedule and resources. This is referred to as a performance measurement baseline. The goal is mutual understanding, and identification of risk is a critical element. Once the integrated plan, including the performance measurement baseline, is in place, its execution is managed using the contractor's earned value management system.

When earned value is used in this way, the reporting burden drops greatly. Integrated product teams that use earned value on a regular basis find little reason to write detailed after-the-fact reports. Electronic access to data eases the reporting burden even further. In acquisition reform terminology, this is what we mean by "insight versus oversight." Empowered teams, using the tools available to them through work breakdown structures, risk management planning, integrated baseline reviews, and earned value management, have all the ingredients for success.

This is not a panacea. Remember, tools and techniques cannot manage programs or control anything … only people can do that. Workforce education and

training therefore is a key function that must accompany any EVMS employment approach.

CONTEMPORARY RESULTS

Defense programs being carried-out today offer testimony that things have changed dramatically from the horror stories of a mere half-dozen years ago. We are seeing examples where technologically challenging programs are being executed on-target while exceeding technical requirements.

Last year, the first DoD Acquisition Excellence Award was presented to the Navy/contractor team managing the F/A-18E/F Super Hornet program. The award cited three keys to the program's success: First, integrated product teams that work. Second, excellent technical achievement … the program met its first flight milestone one month early and with a 1,000 lb. favorable weight margin. And the third key was McDonnell Douglas's IMICS, the fully integrated earned value management system that you will hear about later today.

The F/A-18E/F aircraft development contract, currently 90% complete and with a target cost of $3.4 billion, is being executed within 1% of its planned value … under running slightly and remaining on schedule. The General Electric engine contract is 95% complete and over its $664 million target by about 8%. The Navy initially estimated these contracts would cost $1.2 billion more than their award values. With all seven airplanes for the development program delivered and with testing well underway, our confidence is growing that the program will meet its cost, schedule and performance objectives. There can be no doubt that the Navy and its contractors have applied lessons they learned from the A-12 program, in which earned value was treated as a reporting tool … not an essential management tool.

The V-22 Osprey, is not as far along in development, but is showing equally dramatic results. The $3 billion development contract with Bell-Boeing is 73% complete and within 2% of its planned value. Like most complex defense weapon systems, the V-22 with its new tilt-rotor technology, involves risk. And similar to other successful programs, the V-22 program team is demonstrating an ability to manage that risk by reliance on integrated product and process development and effective earned value management.

Of course, not all programs can be expected to come in so close to their targets, nor does "successful management" necessarily equate to original on-target performance. Earned value enables managers of programs, in which risk manifests itself, to recognize the resource implications much earlier, allowing time for graceful adjustments to schedule or performance goals. EVMS, properly applied, is a tool which allows for the execution of programs incorporating the technological advances necessary to maintain a competitive advantage.

SUMMARY

I would like to leave you with a few thoughts to summarize and conclude my remarks.

First, acceptance of change presents opportunities to improve both government and industry management practices. Seizing these opportunities requires us to ensure we have the ability to manage the uncertainty or risks associated with that change. What we absolutely do not want, is to suppress the change and miss the opportunities that always accompany the risks.

Second, acquisition reform initiatives, can improve our ability to manage the risks, if we are motivated and equipped to properly use the tools available to us. The best management tools, such as EVMS, cannot achieve the desired results unless they are placed in the hands of individuals who know how to use them and accept responsibility for there application.

Third, those of you who are new to the use of earned value should benefit from those who have tripped over the pebbles on this path before. Defense and non-defense programs are more alike than they are different when it comes to applying sound management principles. The same can be said for hardware and software. To that end, I invite colleagues from other agencies to call on my office for any collaboration you think might be useful, as we all seek to improve capital asset management throughout the federal government.

It has been an honor to be with you today. Conferences like this one provide opportunities for us to share best practices, learn from one another, and ultimately better serve our constituents. I wish you a successful and productive two days. Thank you.